Is ASEAN Trade Pattern Complementary To AFTA And TAc?

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This paper investigates the impact of the ongoing process of ASEAN trade liberalization on trade patterns of the ASEAN members. A modified gravity model incorporating exchange rate volatility and regional integration is estimated for each of the seven major ASEAN economies for the period of 1994 to 2009. The result observes substantial amount of heterogeneity among the members' trade pattern.

Key Words: Economic Integration, Trade Integration, ASEAN

JEL Classifications: C33, F15

1. Introduction

Regional economic cooperation usually begins with the formation of free trade agreements and ends with the adoption of a common currency. The wave of globalization has spawned a number of regional arrangements in the world, which is intensified after the demise of the cold war. The major growth of regional economic co-operation and trading arrangements has been witnessed during the second half of the twentieth century. However, ASEAN countries are often considered as highly credible candidates for successful regional integration, and even for a currency union (Bayoumi and Eichengreen, 1997). Almost all members have maintained substantial high economic growth in the 2000s along with remarkable success in their integration process. ASEAN leaders are extending their Free Trade Areas (AFTA) outside the region. The treaty of amity and cooperation (TAC) has also become an important part of ASEAN intra- and extra-regional integration process.

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In spite of their extensive initial progress, the process of ASEAN regional integration has often been criticised (Sally, 2006, Sen, 2006, Pomfret, 2007). The success of ASEAN trade integration has also been under question. The ultimate success of regional trade integration depends much on homogeneity of the members' trade pattern. This paper investigates the

trade pattern of the ASEAN members by controlling the integration activities and combining with the exchange rate risk. To do this, this study applies a gravity model augmented with two FTA dummies, namely $afta_t$ and tac_t, and currency volatility variable. Study of the model for each ASEAN members creates scope to observe the trade pattern of the individual ASEAN members with their ongoing intra- and extra-ASEAN integration process. To our knowledge, this is the first study that explains trade patterns of ASEAN at individual country level.

The remainder of the paper is organized as follows. The next section briefly discusses the previous literature on ASEAN integration process. Section 3 outlines concepts and estimation of models. In Section 4, the study discusses data followed by econometric results and interpretations. Section 5 concludes the paper, drawing policy implications for trade integration and currency union in ASEAN.

2. Review of existing literature

Diverse opinion exists about ASEAN regional economic integration in the literature (Sally and Sen, 2005; Sally, 2006; Sen, 2006). The strength and credibility of the FTAs developed by ASEAN or its individual members is under question, even though the negotiations are WTO consistent. Apart from goods, ASEAN opportunity in services, investment, trade facilitation, regulatory cooperation and dispute settlement are also subject to consideration (Sen, 2006). Internal political and social complexities among ASEAN members act as important factors against effective and successful FTAs. Besides, the possibility exists for other ASEAN members to misinterpret the FTA strength of Singapore, which would in turn lead to development of weak and market distorting FTAs (Sally, 2006 and Sally and Sen, 2005). Even after providing some better indications for FTAs, Thailand suffers from complications in the process and the level of policy directions. Pomfret (2007) also denies for many of the Asian agreements to have serious contents, though he agrees with the difficulties involved in measuring regionalism.

However, Richardson (2005) identifies ASEAN members as attractive trade partners for Australia and New Zealand. ASEAN gradually increases stability, prosperity and economic integration with other significant parts of Asia, which makes ASEAN globally attractive for trade and investment. Hashmi and Lee (2008) mention the current East Asian economic integration process as an effective step for unmarked trade liberalization process. They propose using initial flexible agreements for currency stabilization, followed by future stiff agreements. They argue that the market-driven economic integration suffers from limited institutional support in terms of Asia-wide FTAs, financial stabilization mechanism, intraregional exchange rate stabilization and 'provision of various types of regional public goods' (Hashmi and Lee, 2008: 121). Besides, the divergence in political and economic system slows down the institutional cooperation. This situation requires flexibility in the integration process until the political and economic structures strongly converge.

Aminia, Fung and Ng (2009) compare the regional integration process between East Asia and Latin America from the economic and trade perspective. Analysing through two integration channels, via market and via agreement, they find that East Asian countries start their trade integration through the market much before developing formal agreements. On the other hand, Latin American countries initiate their integration through formal treaties. In comparison, East Asia shows stronger economic integration than Latin America. They interpret this phenomenon as a result of strong political bargaining power achieved through market-oriented integration.

Thus, numerous non-empirical studies of ASEAN regional integration support the currency union. Beside the rigorous study on the regional integration process, a number of studies apply the Computational General Equilibrium (CGE) modelling technique for assessing different aspects of East Asian monetary union and regional FTAs (Ballard and Cheong, 1997, Urata and Kyota, 2003, Gilbert, Scollay and Bora, 2004, Lee *et al.*, 2004,and Plummer and Wignaraja, 2007). Resulting summary, these wide area studies fail to provide any decision towards a specific solution. Rather, a more focused study on a specific region might provide a précised policy recommendation.

3. Methodology

Based on the theoretical framework of Anderson and van Wincoop (2003), the augmented trade flow model for this study appears as follows:

$$\ln trade_{xyt} = \alpha_0 + \alpha_{xy} + \alpha_t + \ _1 \ln gdp_{xt} + \ _2 \ln gdp_{yt} + \ _3 \ln pop_{xt} + \ _4 \ln remoteness_{xt}$$

$$+ \ _5 \ln remoteness_{yt} + \ _6 \ln distance_{xy} + \ _7 \ln volatility_{xat} + \ _8 \ln volatility_{ayt}$$

$$+ \ _9 \ln inflation_{xt} + \ _{10} \ln fdi_{xt} + \ _{11} CLB_{xy} + \ _{12} asean_{yt} + \ _{13} afta_{yt} + \ _{14} tac_{yt} + \varepsilon_{xyt}$$

…… *(1)*

Here, a_t^3 specifies years and is common to all country pairs, a_{xy}^3 is specific to each country-pair and common for the time, and ε_{xyt} is the error term. gdp_x and gdp_y are the GDP of country x and country y, $distance_{xy}$ is the distance between the trade partners x and y, and CLB_{xy} is 1 if the country-pair share common land border and "0" otherwise.

In this study, the US dollar has been considered as the standard transaction medium for both the reporting country and the partner country. Under this assumption, currency risk has been defined as:

$$volatility_{xat} = \frac{\sqrt{\frac{1}{K}\sum_{k=Jan1_t}^{Dec31_t}(e_{xak} - \mu_t)^2}}{\mu_t} \quad \ldots\ldots\ldots (2)$$

$$volatility_{ayt} = \frac{\sqrt{\frac{1}{K}\sum_{k=Jan1_t}^{Dec31_t}(e_{ayk} - \mu_t)^2}}{\mu_t} \quad \ldots\ldots\ldots (3)$$

Here, *Equation (2)* expresses the risk associated with the exporter's currency, and *Equation (3)* expresses the importer's transaction risk due to currency volatility.

Baier and Bergstrand (2002) introduce the "remoteness" proxies for the multilateral resistance term as follows:

$$r_x = \left[\sum_{k=1,k\neq x}^{N} gdp_k \left(distance_{xk}\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}} \quad \ldots\ldots\ldots (4)$$

$$r_y = \left[\sum_{k=1,k\neq y}^{N} gdp_k \left(distance_{ky}\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}} \quad \ldots\ldots\ldots (5)$$

Here, the value of σ is estimated following Obstfeld and Rogoff (2001). According to this method, remoteness is calculated for $\sigma = 1 \ldots\ldots 6$, and the value at $\sigma = 4.5$ is used because

the variation among the calculated remoteness value for $s_, = 4$ and $s_, = 5$ is comparatively low.

Carrere (2006) defines the population of the exporting country, pop_x, as a proxy for the capital endowment ratio. The reporting country's inflation, $inflation_x$, is supplemented to the model to capture the impact of changes in the price level on trade. Besides, foreign direct investment has been an important role player in the ASEAN economy. Cheap labour, large markets and geographical position have made ASEAN members attractive to foreign investors. Hence, the reporting country's foreign direct investment variable, fdi_x, is included in the model to capture the FDI impact on ASEAN trade.

As the objective of the model is to estimate the trade pattern of the ASEAN members as the impact of their regional integration, regional integration is controlled by imposing some FTA dummies in the model. For ASEAN regional integration, two treaties have been playing an important role in the process, namely, ASEAN free trade agreement (AFTA) and the treaty of Amity and Cooperation (TAC). ASEAN has already developed the free trade area within the region, and is currently extending the area outside the region. To capture the impact of AFTA, a dummy variable, $afta_y$, is applied to the model. In addition, an ASEAN membership dummy, $asean_y$, is applied to differentiate the ASEAN members' AFTA impact from the non-members' AFTA impact. The third integration dummy, tac_y, appears in the model to capture the impact of the treaty of Amity and cooperation on ASEAN trade.

Thus, the expected signs for the standard gravity variables are as follows:

$$_1 > 0, \quad _2 > 0, \quad _3 < 0, \quad 4 > 0, \quad 5 > 0, \quad 6 < 0$$

$asean_{yt}$ holds "1" if the trading partner is an ASEAN member and "0" otherwise. For AFTA, different levels of integration are observed among the ASEAN members and the non-member partners. To capture the impact of these different levels, three different values are used. $afta_{yt}$ holds "2" if the trading partner is actively participating in ASEAN free trade agreement; it holds "1" if the agreement between the reporting country and the trading partner is at dialogue stage; and "0" otherwise. For, tac_{yt}, unity is applied if the trading partner is actively participating in the treaty of Amity and Cooperation and "0" otherwise.

This paper analyses exports and imports separately for each of the selected ASEAN members. As the model presented in *Equation (1)* measures the trade flowing from country x to country y, this model is fitting the export analysis. Here, country x is considered as the

exporting country (also mentioned as reporting country) and country y is considered as the trading partner.

Alternatively, the import model is slightly changed from *Equation (1)*. Here, the importing country is treated as the reporting country. Hence, country y is the reporting country and country x is the trading partner. This concept modifies the import model as follows:

$$\ln trade_{xyt} = \alpha_0 + \alpha_{xy} + \alpha_t + {}_1 \ln gdp_{xt} + {}_2 \ln gdp_{yt} + {}_3 \ln pop_{xt} + {}_4 \ln remoteness_{xt}$$

$$+ {}_5 \ln remoteness_{yt} + {}_6 \ln dis\tan ce_{xy} + {}_7 \ln volatility_{xat} + {}_8 \ln volatility_{ayt}$$

$$+ {}_9 \ln \inf lation_{yt} + {}_{10} \ln fdi_{yt} + {}_{11} CLB_{xy} + {}_{12} asean_{xt} + {}_{13} afta_{xt} + {}_{14} tac_{xt} + \varepsilon_{xyt}$$

…… *(6)*

Equation (1) and *Equation (6)* have been estimated for each of the selected ASEAN members to investigate the impact of their currency risk on exports and imports.

4. Data Sources and Empirical Analysis

4.1 Description and sources of data

This paper concentrates on trade of 7 ASEAN members among themselves and with 10 non-member partners. For ASEAN, three members are excluded due insufficient bilateral trade data. The non-member countries are selected from the top of ASEAN trade partners' list based on total trade, whose preferable international transaction medium is US dollars. Hence the Euro members and Great Britain are excluded in the list. Thus sixteen countries are selected for the analysis of this chapter - seven are ASEAN members and nine are non-members - who cover more than seventy percent of total ASEAN trade.[1]In addition, New Zealand is also included in the trading partners' list. The reason behind is that ASEAN has already developed free trade area jointly with Australia and New Zealand. The list of countries is provided in Appendix Table 2.

The estimated period of study for this chapter is from 1994 to 2009. Studying 16 recent years of bilateral trade is significant in that it encompasses the recent trade impact due to the dynamic nature of trading outcomes. Furthermore, the major initiatives for intra- and extra-ASEAN regional integration are taken after the 1997-98 Asian financial crises. The selected

[1] Detail is shown in Appendix Table 2

study period captures the impact of these integration initiatives as well as the impact of recent world financial crises.

The annual data on exports and imports are collected from the IMF *Direction of Trade Statistics (DOTS)* against 16 other selected trading partners. A small amount of export and import data are unavailable in the IMF series, which is collected from UN *COMTRADE* database and adjusted with the IMF series. Data on GDP, population, inflation and FDI inflow are collected from the World Bank *World Development Indicator (WDI)* database. Distance between countries is calculated based on the country location provided by the CIA *World Fact-book*. Information on common land borders is also collected from the CIA *World Fact-book* database. The bilateral exchange rate data are collected from different sources provided in DATASTREAM for different countries. Preference is given to the official exchange rates of individual countries. Information on the different integration stages of the ASEAN free trade agreement and the Treaty of Amity and Cooperation (TAC) between the ASEAN members and the selected trading partners is collected from the ASEAN Secretariat website.

4.2 Analysis of trade flow

Both exports *(Equation 1)* and imports *(Equation 6)* models are separately estimated for each of the selected ASEAN members against 16 selected trade partners. Both the fixed effect models and the random effect models are estimated for each of the 14 panels. Hausman's specification test (Hausman, 1978) is used to examine the existence of correlation between the error terms and the regressors. If the correlation exists, the fixed effect approach is applied. Otherwise, the random effect approach is applied. Though both models support the efficiency of almost similar estimators, the Hausman test does not reject the null hypothesis that the coefficients of the FE model and the coefficients of the RE model are equal except for Bruneian imports. Hence, apart from Brunei's imports, the estimates of the RE models are preferred to the FE models for all other panels.

Appendix Table 3.1 and Appendix Table 3.2 report the results for exports and imports respectively. In both cases, results are presented based on the preferences of the Hausman test. The standard errors are presented in parentheses. The exports models have considerably high explanatory power except for the Philippines with moderate explanatory power and low for Brunei. In case of imports, except for Singapore and Brunei, each of the models has considerably high explanatory power.

The elasticity of the standard gravity variables mostly appear with expected signs with some exceptions. For exports, coefficients of GDP for Thailand and Brunei are negative, and the coefficients fail to be significant even at 10 percent confidence level. In case of imports, coefficients of GDP for Vietnam and Brunei turn out to be negative, and coefficients of distance for the Philippines, Thailand and Singapore are found to be positive. All these coefficients fail to be significant even at 10 percent confidence level. To check the robustness, all models with contradictory coefficients are re-estimated omitting the contradictory variable, and the results are found similar to the previous result.

The estimates of the exports equations *(Equation 1)* are reported in Appendix Table 3.1. These estimates depict an asymmetric pattern of ASEAN exports. For the case of Malaysia, the estimated significant coefficients could be interpreted as follows. First, a 1% change in the partner country's GDP would change 0.7146942% of the exports from Malaysia to the partner country. Second, a 1% change in distance between the Malaysia and the partner country would change 1.192214% of exports between them in the reverse direction. Third, an increase in 1% volatility in the Malaysia's currency would decrease exports from them by 0.028451%, while an increase in 1% volatility in the partner country's currency would enhance exports to them by 0.0368269%. Fourth, exports are positively influenced by 0.0368269% for every 1% change in the Malaysia's inflation. Finally, the trading partner's membership in the TAC positively influences the Malaysian exports by 0.1660195%.

For Indonesian exports, the estimated coefficients are interpreted as follows. First, a 1% change in the partner country's GDP would change 0.6390926% of Indonesian exports, while a 1% change in distance between Indonesia and the partner country would change 0.9514141% of exports between them in the reverse direction. Second, a 1% change in the Indonesian population would change 28.37287% of exports from the Indonesia to the partner country. The magnitude of the coefficient is unusually high, and the level of significance is 10 percent, which is comparatively low. Third, an increase of 1% volatility in Indonesian currency increases their exports to the partner countries by 0.0410088%. Similarly, an increase of 1% volatility in the partner country's currency enhances Indonesian exports to them by 0.0218422%. This result is unusual to the normal assumption. Fourth, exports are inversely influenced by 0.00709% for every percentage change in Indonesian FDI inflow. Fifth, having an ASEAN free trade agreement with the trading partners increases Indonesian exports by 0.2447203%. Finally, the trading partner's membership in TAC positively influences Indonesian exports by 0.1844933%.

The identified significant elasticity of the Philippines includes the following changes. Firstly, a 1% change in the partner country's GDP would change 0.8049134% of exports from the Philippines to the partner country. Secondly, a 1% change in the population of the Philippines would change 216.5048% of exports from the Philippines to the partner country. This result is unusually high with high level of significance.

In case of Thailand, the estimates significant coefficients change in following ways. Firstly, a 1% change in the partner country's GDP would change 0.6375827% of exports from the Thailand to the partner country. Secondly, a 1% change in the distance between Thailand and their trading partner inversely changes 0.9609273% of exports Thai exports. Thirdly, the trading partner's membership of the TAC positively influences Thai exports by 0.3239847%.

The estimated significant coefficients for Singaporean exports are interpreted as follows. Firstly, a 1% change in the partner country's GDP would change 0.6723196% of exports from Singapore to the partner country. Secondly, a 1% change in the distance between Singapore and its trading partner would change 1.036162% of Singaporean exports in the reverse direction. Thirdly, having an ASEAN free trade agreement with the trading partner decreases Singaporean exports by 0.1710256%. This result is quite unusual, and a possible reason for this result would be that Singapore maintains stronger export relations with non-AFTA trading partners. Finally, the trading partner's membership in TAC positively influences Singaporean exports by 0.4491364%.

The only significant coefficient of Vietnamese exports indicates that a 1% change in the partner country's GDP would change 1.182722% exports from Vietnam to the partner country.

For Brunei, the identified significant exports elasticity is interpreted as follows. Firstly, a 1% change in the partner country's GDP would change 2.650857% of exports from Brunei to the partner country. Secondly, having an ASEAN free trade agreement with the trading partner would decrease Bruneian exports by 1.75667%, which is quite unusual to the usual assumption. Thirdly, the trading partner's membership in TAC positively influences Brunei exports by 2.268135%.

Neither of the members' country specific dummy is found to be significant even at 10 percent confidence level. On the other hand, the significant time specific dummy appears only for Indonesia and the Philippines. Hence, neither of these members' exports is influenced by any

specific trade partner, while Indonesia and the Philippines' exports would be affected by economic shocks at different times.

Appendix Table 3.2 reports the estimates of imports models *(Equation 6)* for 7 ASEAN members. Same as the exports, the ASEAN members' imports also show the asymmetric pattern.

For Malaysian imports, the estimated significant coefficients are interpreted as follows. Firstly, a 1% change in the trading partners' GDP would change 1.248027% of imports to Malaysia from the partner country. Secondly, the trading partner's membership in the TAC negatively influences Malaysian imports by 0.3510575%. The result of TAC membership is contradictory to usual assumptions, which might be attributable to substantial influence of imports from Hong Kong, Saudi Arabia, UAE and the USA.

In case of Indonesian imports, the estimated significant coefficients are interpreted as follows. Firstly, a 1% change in the trade partner's GDP would change 0.9793088% of Indonesian imports from the partner country. Secondly, Indonesia imports 0.4171513% more from the partners who have ASEAN free trade agreements. Thirdly, the partner's membership in the TAC negatively influences Indonesian imports by 0.9124753%. Contrary to usual assumptions, however, the trade impact of TAC membership might be attributable to substantial influence of Hong Kong, Saudi Arabia, UAE and the USA on Indonesian imports.

The only significant coefficient for the Philippines' imports is the GDP of the partner country (x), which is significant at a 1% level. Imports are positively influenced by 0.6527932% for every percent change of the partner's GDP. None of the integration dummies are found to be significant for the Philippine imports. The common land border dummy is dropped due to collinearity.

The estimated coefficients of Thai imports have been interpreted as follows. First, a 1% change in the partner country's GDP would change 0.9505412% of Thai imports from the partner country. Second, a 1% change in the partner country's population would inversely change 0.2322224% of Thai imports from the partner country. Third, a 1% change in the partner's remoteness from the rest of the world would negatively influence 0.5160686% of Thai imports. Fourth, every percentage change in Thailand's FDI inflow would inversely affect the Thai imports by 0.1849464%. Fifth, Thailand imports 1.065964% more from ASEAN members than other trading partners. Finally, Thailand imports 0.2668174% less from trade partners that are participating in the ASEAN free trade agreements. The last two

findings jointly show that Thailand imports are less dependent on the non-member AFTA partners.

For Singaporean imports, the estimated significant coefficients are interpreted as follows. Firstly, a 1% change in the partner country's GDP would change 1.977752% of Singaporean imports from the partner country. Secondly, Singapore imports 2.08666% more from trade partners that have ASEAN free trade agreements. Thirdly, the partner's membership in TAC negatively influences Singaporean imports by 2.40892%. Though the last finding is counter to usual assumptions, the result might be attributable to the substantial influence of Hong Kong, Saudi Arabia, UAE and the USA on Singaporean imports.

In case of Vietnam, the estimated significant imports elasticity is interpreted as follows. Firstly, a 1% change in the partner country's GDP would change 1.012593% of Vietnamese imports from the partner country. Secondly, a 1% change in the partner country's remoteness from the rest of the world would inversely affect 0.7359301% of Vietnamese imports. Thirdly, a 1% change in the distance between Vietnam and its trading partner would change 0.8153706% of Vietnamese imports in the opposite direction.

The estimated result for the Bruneian imports model shows that a 1% change in the partner country's remoteness from the rest of the world inversely changes 16.54073% of Bruneian imports from the partner country. Apart from that, neither of the coefficients is found significant.

Similar to the exports models, the imports models fail to find any of the members' country specific dummy as significant even at 10 percent confidence level. This implies that neither of these members' imports is influenced by any specific trade partner. On the other hand, the significant time specific dummy appears only for Malaysia and Thailand. Hence, these two members' imports would be affected by economic shocks at different times.

In summary, this study emphasizes two major findings. First, when the intra- and extra-ASEAN trade data are combined together, the major seven ASEAN members are found to suffer from substantial heterogeneity in their trade pattern for both exports and imports. Secondly, ASEAN extra-regional integration is at a very early stage to observe sufficient advantage. There exists scope for further initiatives for more intense integration and harmonization in the trade pattern. Furthermore, some of the early stage extra-ASEAN AFTA members and TAC members already demonstrate intense trade relations with some ASEAN

members. Selection of the proper path of integration with these trading partners could provide long-term trade advantages to ASEAN members.

5. Conclusion

This paper investigates the impact of ASEAN integration activities on their trade pattern. The augmented gravity model of trade designed in this paper captures the combined impact of currency volatility and the intra- and extra-regional integration initiatives on seven selected ASEAN members. Substantial diversity is observed in the impact in terms of both the trade pattern and the integration effect.

The study bears significant policy implications for ASEAN members. Necessary harmonization of trade policy would remove the existing diversity and would bring similar integration benefit to each ASEAN members.

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Appendix 1

Appendix Table 1.1: Trade share of selected trading partners

Trade partners	Share to total		
	Exports from ASEAN	Imports by ASEAN	Total trade
China	10.1	13.3	11.6
Japan	9.6	11.4	10.5
United States of America	10.1	9.3	9.7
Malaysia	6.0	6.6	6.3
Singapore	5.6	6.1	5.8
South Korea	4.2	5.6	4.9
Hong Kong	7.0	1.5	4.4
Indonesia	4.5	3.9	4.2
Thailand	3.4	4.3	3.8
Australia	3.6	2.0	2.9
India	3.3	1.7	2.5
Viet Nam	2.0	1.2	1.6
United Arab Emirates	1.3	1.9	1.6
Philippines	1.7	1.3	1.5
Saudi Arabia	0.5	2.5	1.5
Total	**73.0**	**72.6**	**72.8**

Appendix Table 1.2: Countries in Currency Risk included Gravity Model

Export and Import						
Brunei	Indonesia	Malaysia	Philippines	Singapore	Thailand	Viet Nam
Australia	Australia	Australia	Australia	Australia	Australia	Australia
China	Brunei	Brunei	Brunei	Brunei	Brunei	Brunei
Hong Kong	China	China	China	China	China	China
India	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong
Indonesia	India	India	India	India	India	India
Japan	Japan	Indonesia	Indonesia	Indonesia	Indonesia	Indonesia
Malaysia	Malaysia	Japan	Japan	Japan	Japan	Japan
New Zealand	New Zealand	New Zealand	Malaysia	Malaysia	Malaysia	Malaysia
Philippines	Philippines	Philippines	New Zealand	New Zealand	New Zealand	New Zealand
Saudi Arabia	Saudi Arabia	Saudi Arabia	Saudi Arabia	Philippines	Philippines	Philippines
Singapore	Singapore	Singapore	Singapore	Saudi Arabia	Saudi Arabia	Saudi Arabia
South Korea	South Korea	South Korea	South Korea	South Korea	Singapore	Singapore
Thailand	Thailand	Thailand	Thailand	Thailand	South	South

					Korea	Korea
United Arab Emirates	United Arab Emirates	United Arab Emirates	United Arab Emirates	United Arab Emirates	United Arab Emirates	Thailand
United States of America	United States of America	United States of America	United States of America	United States of America	United States of America	United Arab Emirates
Viet Nam	Viet Nam	Viet Nam	Viet Nam	Viet Nam	Viet Nam	United States of America

Appendix 3

Appendix Table 3.1: List of coefficients for exports

	Malaysia	Indonesia	The Philippines	Thailand	Singapore	Vietnam	Brunei
$lngdp_x$	.0878294	.1737593	.0886273	-.5961229	.4477015	.7464351	-1.850292
	(.2573586)	(.2787959)	(2.366062)	(1.026394)	(.8078651)	(5.776047)	(4.61806)
$lngdp_y$	.7146942***	.6390926***	.8049134***	.6375827***	.6723196***	1.182722***	2.650857***
	(.0604494)	(.0734402)	(.211565)	(.0882644)	(.0776482)	(.1527083)	(.4665009)
$lnpop_x$	2.4533	28.37287*	216.5048***	8.953341	-1.431084	27.15387	-58.71489
	(3.346123)	(15.16088)	(58.08143)	(16.68522)	(1.259442)	(38.14568)	(102.7687)
$lnremoteness_x$	-1.390961	-1.492743	-11.37439	-4.990866	-.1782556	8.109333	11.87831
	(1.30527)	(1.139849)	(16.6323)	(5.676154)	(2.894247)	(16.06488)	(18.429)
$lnremoteness_y$	.2625336	.0093477	-.6552752	.4170399	.0587603	-.3819846	-.5385238
	(.2146944)	(.2398777)	(.5350293)	(.3094716)	(.2508528)	(.4421003)	(1.076955)
$lndistance_{xy}$	-1.192214***	-.9514141*	-.4557235	-.9609273*	-1.036162***	-.4291644	-1.586208
	(.3336629)	(.5038022)	(.7001974)	(.5045689)	(.3646109)	(.4734928)	(1.868802)
$lnvolatility_{xa}$	-.028451***	.0410088**	-.1087334	-.0297385	-.0315906	-.0027228	.6142456
	(.0100224)	(.020472)	(.0840922)	(.0407508)	(.0382236)	(.1342169)	(.4063392)
$lnvolatility_{ay}$	.0368269***	.0218422*	.0827854	.0222734	.0119976	-.0166643	.0699591
	(.0123116)	(.0128411)	(.0613551)	(.0136844)	(.0141194)	(.0335786)	(.1410743)
$lninflation_x$	.119209***	.0257091	-.0526333	-.0037412	.0168623	.0579946	-.2587314
	(.0389287)	(.04296)	(.2411673)	(.035963)	(.0228278)	(.2732984)	(.277963)
$lnfdi_x$	-.0239062	-.00709*	.0217024	.0000697	.0095659	.0998364	.4401504
	(.0362117)	(.0041025)	(.1503718)	(.0665841)	(.093681)	(.2970912)	(.2866976)
CLB_{xy}	-.5719191	.2755472		.8170239		-.6503356	1.340194
	(.5654539)	(.8037775)		(.9609424)		(1.02907)	(2.788922)
$asean_y$	-.3383516	-.8089072	.4322366	-.5251594	-.1447483	.450849	2.241623
	(.8645567)	(.779203)	(1.286358)	(.9309855)	(.8160463)	(1.045459)	(3.040646)
$afta_y$	.0422717	.2447203***	.2932025	.0335125	-.1710256**	-.0911119	-1.75667**
	(.0491879)	(.0630369)	(.3076062)	(.0760215)	(.0738078)	(.1467583)	(.7136266)
tac_y	.1660195***	.1844933***	-.0913212	.3239847***	.4491364***	-.1164265	2.268135***
	(.0560956)	(.0685968)	(.3583085)	(.0786433)	(.0785713)	(.1712002)	(.8183591)
$countrydummy_{xy}$	.0009321	.0030723	.0046821	-.0016736	-.0005608	-.01453	.0029297
	(.0052557)	(.0059471)	(.0109229)	(.0072101)	(.0059021)	(.0097942)	(.0211452)
$timedummy_t$	-.0314436	-.3862164*	-4.353427***	-.0852361	.0371592	-.1918815	1.657985
	(.0776301)	(.2091879)	(1.212944)	(.2197903)	(.0334239)	(.2705897)	(2.321409)
a_0	-32.0673	-533.3493*	-3911.486***	-135.0342	22.54721	-513.5228	733.7076
	(58.63282)	(292.6043)	(1039.731)	(278.4307)	(15.92335)	(589.1526)	(1250.5060)
R-sq	0.8474	0.8167	0.5274	0.6843	0.7624	0.7603	0.3651
corr(u_i, Xb)	0	0	0	0	0	0	0
RE of ui	Gaussian	Gaussian	Gaussian	Gaussian	Gaussian	Gaussian	Gaussian
F (all coefficient)/ Wald $?^2_k$	1538.17***	1004.74***	84.72***	1036.16***	692.46***	525.99***	91.23***

Note: ***, ** and * denote1%, 5% and 10% level of significance respectively.

Appendix Table 3.2: List of coefficients for imports

	Malaysia	Indonesia	The Philippines	Thailand	Singapore	Vietnam	Brunei
$lngdp_x$	1.248027***	.9793088***	.6527932***	.9505412***	1.977752**	1.012593***	.5985689
	(.1316837)	(.2164572)	(.2064551)	(.0985604)	(.7840369)	(.1595485)	(.9671526)
$lngdp_y$	.1680276	.3635068	1.274921	.5162028	.6057015	-1.152358	-3.812561
	(.4889609)	(.7493125)	(1.175575)	(.6603507)	(3.688944)	(2.588311)	(3.157593)
$lnpop_x$	-.0525938	-.0351899	.058605	-.2322224***	-1.171447	.1198091	3.444929
	(.1401815)	(.2027304)	(.2048439)	(.0743443)	(.6830514)	(.1437741)	(3.804992)
$lnremoteness_x$	-.5505656	-.1822577	-.8654474	-.5160686***	-1.470109	-.7359301**	-16.54073***
	(.3626121)	(.4784219)	(.5299378)	(.1903535)	(1.657725)	(.3736043)	(4.076617)
$lnremoteness_y$	1.671228	-.9583165	6.369479	3.295463	1.741895	2.024492	-.5225739
	(2.596841)	(3.568477)	(7.363578)	(3.708436)	(9.906256)	(6.99562)	(9.533783)
$lndistance_{xy}$	-.5506351	-1.060075	.6228785	.0030236	.7649459	-.8153706**	
	(.5368774)	(.9712565)	(.7329148)	(.2923953)	(2.225779)	(.4081076)	
$lnvolatility_{xa}$	.0109839	.0227078	.0253265	-.009427	-.0569503	-.0034665	.1191105
	(.0242543)	(.0399277)	(.0327044)	(.0170003)	(.1326435)	(.0253848)	(.1177094)
$lnvolatility_{ay}$	-.0029462	.0122574	.0464416	-.0043029	.0226546	.0461129	.1559511
	(.0185583)	(.064783)	(.0427606)	(.0454524)	(.3644181)	(.0711408)	(.3054924)
$lninflation_x$	.0563391	-.0386748	.0334887	.0440144	-6.638972	.192583	-.3245682
	(.07527)	(.1247021)	(.1230708)	(.0341456)	(16.46047)	(.1519396)	(.2116098)
$lnfdi_x$	.0730818	-.0058163	-.0487815	-.1849464**	.0804185	.194253	.0120424
	(.0719492)	(.0119535)	(.0764894)	(.0843692)	(.5957079)	(.1815518)	(.1388717)
CLB_{xy}	-.8678015	.0255636		.6781291		-.4280551	
	(.8771833)	(1.348761)		(.5040793)		(.8970301)	
$asean_y$	2.084115	-.0201684	1.144728	1.065964**	1.219326	.1456352	
	(1.347915)	(1.353706)	(1.31554)	(.5173074)	(4.999428)	(.8806185)	
$afta_y$	-.1153664	.4171513**	.0377581	-.2668174***	2.08666***	-.0380301	-.6787156
	(.0943753)	(.1976632)	(.1535575)	(.0962273)	(.6399093)	(.111931)	(.5667196)
tac_y	-.3510575***	-.9124753***	-.2610961	.1093637	-2.40892***	.1904269	.2931943
	(.1116841)	(.2182873)	(.1840028)	(.0997364)	(.7599847)	(.1310177)	(.6998587)
$countrydummy_{xy}$	.001752	-.0023883	.0084974	-.0003639	-.0039545	-.0025382	
	(.0082947)	(.0103313)	(.0119782)	(.0038554)	(.0355699)	(.0083219)	
$timedummy_t$	.0538232*	.0264666	.0145894	.1170475**	.0333222	.2090991	-.1246939
	(.0284547)	(.033905)	(.031454)	(.0521371)	(.1450647)	(.1836744)	(.1621862)
a_0	-10.6086	-5.672823	-30.95366	-8.497896	-2.449698	21.48106	15.17725
	(10.31327)	(19.17911)	(25.59303)	(15.47781)	(78.06904)	(57.58994)	(86.47022)
R-sq	0.8573	0.6981	0.6195	0.8673	0.1935	0.7131	0.0341
corr(u_i, Xb)	0	0	0	0	0	0	-0.9790
F (all ui=0)							8.20***
RE of ui	Gaussian	Gaussian	Gaussian	Gaussian	Gaussian	Gaussian	
F (all coefficient)/ Wald $?^2$	572.52***	253.11***	93.37***	621.66***	55.06***	783.65***	2.61***

Note: ***, ** and * denote 1%, 5% and 10% level of significance respectively.